

Application of Bragg Light Scattering Method for Studying of Acoustical Activity in Crystals

F.R. Akhmedzhanov
Samarkand State University
Samarkand

The Bragg light scattering method for studying acoustical activity was applied to pure and Mg doped Lithium Niobate crystals at a room temperature. The samples were cut from optically clear single crystals and oriented along the crystallographic axis of the third order with the accuracy of 10°. The plane-polarized transverse acoustic waves with frequencies of 0.4-1.5 GHz were excited by quartz piezoelectric transducers.

Measurements of the dependence of the scattered light intensity from the distance to the piezotransducer along the direction of the acoustic wave propagation have been carried out in an automatic regime using a computer under the control of a special program.

The obtained values of the scattered light intensities have been used to calculate the specific rotation of the polarization vector in a given acoustic wave by computer modeling. The quantities of the attenuation coefficient and the effective constant of the acoustical activity along the investigated direction were determined simultaneously from the experimental data.

The high efficiency and trustworthiness of the results of the simultaneous calculation of the attenuation coefficient and the specific rotation of the polarization plane in gyrotropic crystals have been shown, as well as the possibility of speculation of experimental curves by varying factors, which are changed in a real experiment.